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Sharing Traditional Knowledge for Commerce — the Power of Bargaining Strength

Across South Asia, traditional communities use knowledge that has been accumulated over many generations to treat sickness and improve food production. Many companies and organizations – particularly those involved in the pharmaceutical industry – have become increasingly interested in such traditional knowledge because it offers the possibility of a 'short cut' to the development of new foods, drugs and other products.

A recent SANDEE study investigates the economic incentives that can be used to protect and sustainably use this traditional knowledge. The study also looks at how revenues from the utilization of traditional knowledge can be shared equitably. Not surprisingly, it finds that both traditional communities and pharmaceutical companies need to be confident that they can profit from working together. However, a number of hurdles can come in the way of developing workable contracts and agreements. The study suggests that actual sharing of the revenues depends, most importantly, on the relative bargaining strengths of the two parties. Factors that affect bargaining strengths need to be taken into account in designing schemes that can help communities benefit from the use of their traditional knowledge.

Traditional knowledge has value as a resource base for developing future biotechnological and pharmaceutical innovations. There has been a long-running debate on whether traditional knowledge can be used to profitably identify active compounds for modern medicine – a process known as pharmaceutical - or bio-prospecting. While the current consensus is that traditional knowledge can help scientists discover new drugs, many problems remain. These include concerns about fair access to the relevant plant resources, costs of converting traditional knowledge to commercial drugs, and distributing the benefits from royalties and marketing fees. Such issues are of import to developing countries, where much of the world's biodiversity and traditional knowledge about this biodiversity exists.

WHY ARE BUSINESSES INTERESTED IN TRADITIONAL KNOWLEDGE?

Traditional knowledge about plant-based medicines derives much of its value from its current use around the world. The World Health Organization, for instance, estimates that close to 80% of the population in developing countries depends on traditional medicine in

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one form or the other. In many developed and developing economies traditional herbal and other plant-based remedies are also enjoying something of a renaissance.

Bio-prospectors and pharmaceutical companies involved in plant-based drugs research are interested in traditional knowledge as an information source for two reasons: (a) it provides valuable leads in the search for active compounds that could be used to produce pharmaceutical drugs; and (b), it can help develop entirely new plant-based pharmaceutical drugs by highlighting the medicinal properties of plants that had previously been unknown outside a community or region.

Pharmaceutical research and development often involves many years of work and considerable financial investment. Because traditional knowledge about medicinal plants can increase the 'hit rate' in the process of identifying active compounds it can save time and money. With the growth in biotechnology research, traditional knowledge no longer represents a relic from the past that needs to be preserved for its intrinsic and aesthetic values. Instead, it is seen as a rich source of raw material for new innovations.

Traditional knowledge about nature and its uses is held collectively and it is not new. In almost all cases, such knowledge is preserved and utilized only through inter-generational transfer within the members of a specific community. There are no pre-existing patents or other intellectual property rights that can protect it. Thus, when it comes to sharing traditional knowledge, a key challenge is to ensure that a fair bargaining process takes place between communities and bio-prospecting companies. The need for equitable bargaining systems gains importance in the light of declining transfer and use of traditional knowledge. This study, undertaken by K. Aparna Bhagirathy, is motivated by concerns about the depletion of traditional knowledge and recent efforts to preserve this knowledge through commercial use.

INVESTIGATING BIO-PROSPECTING

Bhagirathy investigates how communities and companies might agree to share traditional knowledge. She looks at incentives that can induce companies to invest in bio-prospecting and persuade traditional communities to share their knowledge. The study asks two key questions: (1) under what conditions do communities and pharmaceutical companies enter into contracts to develop traditional-knowledge-based innovations? And, (2) what factors influence the way in which the benefits from the commercial use of traditional knowledge are shared between these two parties?

To find the answers to these questions, Bhagirathy examines a hypothetical situation in which there are only two economic agents - Agent 1 represents a community that holds traditional knowledge and Agent 2 represents a pharmaceutical company with the technology to develop an innovation based on this knowledge. The study examines profit-sharing agreements between the two agents with the help of an economic model based on a game-theoretic framework.

TESTING DIFFERENT BARGAINING SCENARIOS

Bhagirathy uses a bargaining model to analyze a number of different scenarios. First, she assumes that both the community and the company are fully informed about the potential costs and revenues associated with their collaboration. However, this assumption rarely holds in practice. While traditional communities possess knowledge about plant resources, pharmaceutical companies are better informed about the potential costs and benefits associated with the development of drugs based on this knowledge. As a result, the expectations regarding future revenue streams from the application of traditional knowledge are likely to be different for these two groups. Thus, Bhagirathy then assesses the impact of this 'asymmetry of expectation' regarding potential revenues.

The paper analyses separate individual profit maximization strategies, as well as a cooperative strategy for joint profit maximization. In the process, several contract structures involving the payment of royalties, fixed license fees or a combination of both are considered. Different types of activities in the various stages of the bio-prospecting cycle (such as whether traditional communities are involved in plant collecting) are also assessed. Finally a situation is analyzed in which an outsider, such as the government or a NGO, is involved.

WHAT MAKES BIO-PROSPECTING WORK?

It is clear that communities and companies will only be interested in entering into a contract to develop drugs based on traditional knowledge if both the parties can earn profits that are at least equal to their costs. The actual sharing of these profits depends on the relative bargaining strengths of the two partners. Factors that affect relative bargaining strengths include the contribution each party makes in the process of developing a medical innovation, the availability of alternative plant resources and information, differences in expectations relating to future revenues and costs, and the involvement of a third party in the negotiations. Each of these factors has a different impact on the final sharing of profits. For instance, under conditions of joint profit maximization, the community has a stronger bargaining position if it supplies the plant resources as well as sharing its knowledge. However, if the company is able to synthesize the compound in the laboratory or if it finds an alternative source, then the community loses some of its bargaining power.

PROTECTING TRADITIONAL KNOWLEDGE

Traditional knowledge is rarely documented. It is preserved by means of oral transfer from one generation to the next. However, as traditional communities come into contact with outside influences, the use of traditional knowledge often declines and with it the transfer of the knowledge from one generation to the next. This means that in many parts of the world, traditional knowledge about the use of plant resources is in danger of being lost forever.

In the last two decades, various rules and regulations have been formulated to try and protect traditional knowledge and also to help communities to gain from their knowledge. At the international level, there are multilateral agreements and guiding principles, such as The Convention on Biological Diversity, which lay down a framework for the sustainable use of biological resources and any associated traditional knowledge and practices. At the national level, countries have incorporated specific provisions into their intellectual property laws and established what have come to be known as *sui generis* systems. These measures define explicit provisions that govern the sharing and usage of traditional knowledge. At a more local level, during the nineties, several pharmaceutical companies and research organizations developed benefit-sharing contracts with traditional communities in the course of ethno-botanical research. It is clear that such contracts – if they are fair and well managed – offer a strong incentive for communities to preserve their traditional knowledge.

SANDEE

The South Asian Network for Development and Environmental Economics (SANDEE) is a regional network that seeks to bring together analysts from the different countries in South Asia to address their development-environment problems. Its mission is to strengthen the capacity of individuals and institutions in South Asia to undertake research on the inter-linkages among economic development, poverty, and environmental change, and, to disseminate practical information that can be applied to development policies. SANDEE's activities cover Bangladesh, Bhutan, Nepal, India, Pakistan and Sri Lanka.

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HOW TO MAKE BIO-PROSPECTING FAIRER

Past efforts at bio-prospecting have shown that, in dealings between traditional communities and bio-prospecting companies, most complications arise in the identification of stakeholders and sharing of profits. A careful understanding of the negotiating positions, bargaining strengths, and asymmetries of expectations of both traditional communities and pharmaceutical companies can definitely mitigate some of these problems. Such an understanding can also help strengthen intellectual property rights related to traditional knowledge.

A lot more information is needed on how to design incentives and contractual arrangements that would guarantee that all parties involved in the bio-prospecting business are treated fairly. This paper identifies a set of conditions that need to be empirically tested. Such research is vital since many developing nations are now taking steps, in terms of legislation and programs, to conserve and promote biodiversity and associated traditional knowledge.

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